

cases of divergency, above referred to, the corresponding convergent solutions are in series infinite in both the ascending and descending directions.

The author observes in conclusion, that the inverse calculus of the process here developed may be employed for the discovery of the generating functions of series whose laws of relation are given.

The Society then adjourned over the Easter holidays to meet again on the 19th of April.

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April 19, 1849.

The EARL OF ROSSE, President, in the Chair.

A paper was read, entitled "On the Meteorology of the Lake District of Cumberland and Westmoreland." By John Fletcher Miller, Esq. Communicated by Lt.-Colonel Sabine, R.A., For. Sec. R.S., &c.

This paper contains the results of meteorological observations made during 1848, similar to those made in the same district in preceding years, which were last year communicated to the Society. On these results, the author remarks that the fall of rain in the lake district, during the year 1848, greatly exceeds the amount in any other year since the register was commenced in 1844; and that there is a similar excess with reference to the number of wet days. The total depth of rain, in 1848, at Seathwaite, the wettest station, was 160·89 inches; and of this quantity, 114·32 inches fell in the six months, February, July, August, October, November and December. In February there fell the unprecedented quantity 30·55 inches.

The mountains flanking the lake-district valleys increase in altitude with great regularity towards the head or eastern extremity of the vale, and it appears that it is there that the greatest depth of rain is invariably found. The amount increases rapidly as the stations recede from the sea, and towards the head of the valley the incremental ratio is exceedingly great. At Loweswater, Buttermere and Gatesgarth, about two miles apart in the same line of valley, the depths of rain were respectively 76 inches, 98 inches and 133·5 inches.

From the observations of the thermometer, the author concludes that the climate in the mountain valleys in this district is milder and more equable, not only than in the open country in their immediate vicinity, but also than in that considerably to the south. This he attributes to the lakes giving out during the winter the heat absorbed by them in the summer, and to the radiation from the rocky mountain breasts in the valleys, but principally to the heat evolved in a sensible form by the condensation of enormous volumes of vapour.

Last summer a pair of Rutherford's self-registering thermometers

were stationed by the author on the summit of Sca-Fell Pike. He states that from the maximum thermometer no correct readings could be obtained; but that the minimum gave the following:—July, 22°; August, 24°; September, 18°; October, —6°; November, —6°; December, —9°. It appears that on the night between the 2nd and 3rd of January the minimum thermometer indicated the extraordinary low temperature —34° Fahr.: at the same date a naked thermometer on grass at Whitehaven fell to +4°, and one on raw wool to —2°·8.

The author states that the results obtained from the mountain gauges during the last year, are in strict accordance with those of the two preceding years, and thus confirm the correctness of the conclusion drawn from them in his former paper, “that the quantity of rain increases from the valley upwards to an altitude of about 2000 feet, above which it begins to diminish.” He does not, however, by any means infer that the law which appears to regulate the distribution of rain in the mountain district of Cumberland will equally apply to every similar locality.

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April 26, 1849.

The EARL OF ROSSE, President, in the Chair.

A paper was read, entitled “A Report upon further Observations of the Tides of the English Channel made by order of the Lords Commissioners of the Admiralty in 1848, with remarks upon the Laws by which the Tidal Streams of the English Channel and German Ocean appear to be governed.” By Captain F. W. Beechey, R.N., F.R.S. Communicated by the Lords Commissioners of the Admiralty.

The author commences this report by observing, that the result of the observations upon the tides in the English Channel, made in the course of the summer of 1848, had confirmed in a satisfactory manner the view he had taken of the tidal phenomena of the channel, in the report communicated to the Royal Society last year, and printed in the Philosophical Transactions (Part I. 1848), namely, that there is a meeting and a separation of the streams between Alderney and the Start: that the whole space between the Start and Scilly is under the joint influence of the channel and offing streams: that from the vicinity of the Start to the vicinity of Hastings the stream runs true up and down the channel; and moreover that this stream throughout turns nearly simultaneously with the time of high and low water on the shore at the virtual head of the tide, which he places in the vicinity of Dover; and lastly, that the streams which meet off the Start are turned down into the Gulf of St. Malo, and *vice versa*.